



PATENT  
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: **Patricia D. Murphy** )  
Application No.: **09/923,327** ) Group Art Unit: **1634**  
Filed: **August 8, 2001** ) Examiner: **Stephanie W. Zitomer, Ph.D.**  
For: **Determining common functional** )  
**alleles in a population and uses** )  
**therefor** )

Commissioner for Patents  
U.S. Patent and Trademark Office  
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Arlington, VA 22202

**STATEMENT ACCOMPANYING SUBSTITUTE SEQUENCE LISTING**

The undersigned hereby states upon information and belief that the Substitute Sequence Listing submitted herewith does not include matter which goes beyond the content of the application as filed and that the information recorded on the diskette submitted herewith is identical to the written Substitute Sequence Listing submitted concurrently herewith. This Substitute Sequence Listing is responsive to an Office Action dated June 17, 2003 (paper no. 6-13).

Respectfully submitted,  
**MORGAN, LEWIS & BOCKIUS LLP**

Dated: 9/16/03

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gat gtt cct tgg ata aca cta aat agc agc att cag aaa gtt aat gag				1271
Asp Val Pro Trp Ile Thr Leu Asn Ser Ser Ile Gln Lys Val Asn Glu		375	380	
	370			

tgg ttt tcc aga agt gat gaa ctg tta ggt tct gat gac tca cat gat	1319
Trp Phe Ser Arg Ser Asp Glu Leu Leu Gly Ser Asp Asp Ser His Asp	
385 390 395 400	
ggg gag tct gaa tca aat gcc aaa gta gct gat gta ttg gac gtt cta	1367
Gly Glu Ser Glu Ser Asn Ala Lys Val Ala Asp Val Leu Asp Val Leu	
405 410 415	
aat gag gta gat gaa tat tct ggt tct tca gag aaa ata gac tta ctg	1415
Asn Glu Val Asp Glu Tyr Ser Gly Ser Ser Glu Lys Ile Asp Leu Leu	
420 425 430	
gcc agt gat cct cat gag gct tta ata tgt aaa agt gaa aga gtt cac	1463
Ala Ser Asp Pro His Glu Ala Leu Ile Cys Lys Ser Glu Arg Val His	
435 440 445	
tcc aaa tca gta gag agt aat att gaa gac aaa ata ttt ggg aaa acc	1511
Ser Lys Ser Val Glu Ser Asn Ile Glu Asp Lys Ile Phe Gly Lys Thr	
450 455 460	
tat cgg aag aag gca agc ctc ccc aac tta agc cat gta act gaa aat	1559
Tyr Arg Lys Lys Ala Ser Leu Pro Asn Leu Ser His Val Thr Glu Asn	
465 470 475 480	
cta att ata gga gca ttt gtt act gag cca cag ata ata caa gag cgt	1607
Leu Ile Ile Gly Ala Phe Val Thr Glu Pro Gln Ile Ile Gln Glu Arg	
485 490 495	
ccc ctc aca aat aaa tta aag cgt aaa agg aga cct aca tca ggc ctt	1655
Pro Leu Thr Asn Lys Leu Lys Arg Lys Arg Arg Pro Thr Ser Gly Leu	
500 505 510	
cat cct gag gat ttt atc aag aaa gca gat ttg gca gtt caa aag act	1703
His Pro Glu Asp Phe Ile Lys Lys Ala Asp Leu Ala Val Gln Lys Thr	
515 520 525	
cct gaa atg ata aat cag gga act aac caa acg gag cag aat ggt caa	1751
Pro Glu Met Ile Asn Gln Gly Thr Asn Gln Thr Glu Gln Asn Gly Gln	
530 535 540	
gtg atg aat att act aat agt ggt cat gag aat aaa aca aaa ggt gat	1799
Val Met Asn Ile Thr Asn Ser Gly His Glu Asn Lys Thr Lys Gly Asp	
545 550 555 560	
tct att cag aat gag aaa aat cct aac cca ata gaa tca ctc gaa aaa	1847
Ser Ile Gln Asn Glu Lys Asn Pro Asn Pro Ile Glu Ser Leu Glu Lys	
565 570 575	
gaa tct gct ttc aaa acg aaa gct gaa cct ata agc agc agt ata agc	1895
Glu Ser Ala Phe Lys Thr Lys Ala Glu Pro Ile Ser Ser Ser Ile Ser	
580 585 590	
aat atg gaa ctc gaa tta aat atc cac aat tca aaa gca cct aaa aag	1943
Asn Met Glu Leu Glu Leu Asn Ile His Asn Ser Lys Ala Pro Lys Lys	
595 600 605	

aat agg ctg agg agg aag tct tct acc agg cat att cat gcg ctt gaa Asn Arg Leu Arg Arg Lys Ser Ser Thr Arg His Ile His Ala Leu Glu 610 615 620	1991
cta gta gtc agt aga aat cta agc cca cct aat tgt act gaa ttg caa Leu Val Val Ser Arg Asn Leu Ser Pro Pro Asn Cys Thr Glu Leu Gln 625 630 635 640	2039
att gat agt tgt tct agc agt gaa gag ata aag aaa aaa aag tac aac Ile Asp Ser Cys Ser Ser Ser Glu Glu Ile Lys Lys Lys Lys Tyr Asn 645 650 655	2087
caa atg cca gtc agg cac agc aga aac cta caa ctc atg gaa ggt aaa Gln Met Pro Val Arg His Ser Arg Asn Leu Gln Leu Met Glu Gly Lys 660 665 670	2135
gaa cct gca act gga gcc aag aag agt aac aag cca aat gaa cag aca Glu Pro Ala Thr Gly Ala Lys Lys Ser Asn Lys Pro Asn Glu Gln Thr 675 680 685	2183
agt aaa aga cat gac agt gat act ttc cca gag ctg aag tta aca aat Ser Lys Arg His Asp Ser Asp Thr Phe Pro Glu Leu Lys Leu Thr Asn 690 695 700	2231
gca cct ggt tct ttt act aag tgt tca aat acc agt gaa ctt aaa gaa Ala Pro Gly Ser Phe Thr Lys Cys Ser Asn Thr Ser Glu Leu Lys Glu 705 710 715 720	2279
ttt gtc aat cct agc ctt cca aga gaa gaa aaa gaa gag aaa cta gaa Phe Val Asn Pro Ser Leu Pro Arg Glu Glu Lys Glu Glu Lys Leu Glu 725 730 735	2327
aca gtt aaa gtg tct aat aat gct gaa gac ccc aaa gat ctc atg tta Thr Val Lys Val Ser Asn Asn Ala Glu Asp Pro Lys Asp Leu Met Leu 740 745 750	2375
agt gga gaa agg gtt ttg caa act gaa aga tct gta gag agt agc agt Ser Gly Glu Arg Val Leu Gln Thr Glu Arg Ser Val Glu Ser Ser Ser 755 760 765	2423
att tca ctg gta cct ggt act gat tat ggc act cag gaa agt atc tcg Ile Ser Leu Val Pro Gly Thr Asp Tyr Gly Thr Gln Glu Ser Ile Ser 770 775 780	2471
tta ctg gaa gtt agc act cta ggg aag gca aaa aca gaa cca aat aaa Leu Leu Glu Val Ser Thr Leu Gly Lys Ala Lys Thr Glu Pro Asn Lys 785 790 795 800	2519
tgt gtg agt cag tgt gca gca ttt gaa aac ccc aag gga cta att cat Cys Val Ser Gln Cys Ala Ala Phe Glu Asn Pro Lys Gly Leu Ile His 805 810 815	2567
ggt tgt tcc aaa gat aat aga aat gac aca gaa ggc ttt aag tat cca Gly Cys Ser Lys Asp Asn Arg Asn Asp Thr Glu Gly Phe Lys Tyr Pro 820 825 830	2615
ttg gga cat gaa gtt aac cac agt cgg gaa aca agc ata gaa atg gaa	2663

Leu Gly His Glu Val Asn His Ser Arg Glu Thr Ser Ile Glu Met Glu	
835 840 845	
gaa agt gaa ctt gat gct cag tat ttg cag aat aca ttc aag gtt tca	2711
Glu Ser Glu Leu Asp Ala Gln Tyr Leu Gln Asn Thr Phe Lys Val Ser	
850 855 860	
aag cgc cag tca ttt gct ctg ttt tca aat cca gga aat gca gaa gag	2759
Lys Arg Gln Ser Phe Ala Leu Phe Ser Asn Pro Gly Asn Ala Glu Glu	
865 870 875 880	
gaa tgt gca aca ttc tct gcc cac tct ggg tcc tta aag aaa caa agt	2807
Glu Cys Ala Thr Phe Ser Ala His Ser Gly Ser Leu Lys Lys Gln Ser	
885 890 895	
cca aaa gtc act ttt gaa tgt gaa caa aag gaa gaa aat caa gga aag	2855
Pro Lys Val Thr Phe Glu Cys Glu Gln Lys Glu Glu Asn Gln Gly Lys	
900 905 910	
aat gag tct aat atc aag cct gta cag aca gtt aat atc act gca ggc	2903
Asn Glu Ser Asn Ile Lys Pro Val Gln Thr Val Asn Ile Thr Ala Gly	
915 920 925	
ttt cct gtg gtt ggt cag aaa gat aag cca gtt gat aat gcc aaa tgt	2951
Phe Pro Val Val Gly Gln Lys Asp Lys Pro Val Asp Asn Ala Lys Cys	
930 935 940	
agt atc aaa gga ggc tct agg ttt tgt cta tca tct cag ttc aga ggc	2999
Ser Ile Lys Gly Gly Ser Arg Phe Cys Leu Ser Ser Gln Phe Arg Gly	
945 950 955 960	
aac gaa act gga ctc att act cca aat aaa cat gga ctt tta caa aac	3047
Asn Glu Thr Gly Leu Ile Thr Pro Asn Lys His Gly Leu Leu Gln Asn	
965 970 975	
cca tat cgt ata cca cca ctt ttt ccc atc aag tca ttt gtt aaa act	3095
Pro Tyr Arg Ile Pro Pro Leu Phe Pro Ile Lys Ser Phe Val Lys Thr	
980 985 990	
aaa tgt aag aaa aat ctg cta gag gaa aac ttt gag gaa cat tca atg	3143
Lys Cys Lys Lys Asn Leu Leu Glu Glu Asn Phe Glu Glu His Ser Met	
995 1000 1005	
tca cct gaa aga gaa atg gga aat gag aac att cca agt aca gtg	3188
Ser Pro Glu Arg Glu Met Gly Asn Glu Asn Ile Pro Ser Thr Val	
1010 1015 1020	
agc aca att agc cgt aat aac att aga gaa aat gtt ttt aaa gga	3233
Ser Thr Ile Ser Arg Asn Asn Ile Arg Glu Asn Val Phe Lys Gly	
1025 1030 1035	
gcc agc tca agc aat att aat gaa gta ggt tcc agt act aat gaa	3278
Ala Ser Ser Ser Asn Ile Asn Glu Val Gly Ser Ser Thr Asn Glu	
1040 1045 1050	
gtg ggc tcc agt att aat gaa ata ggt tcc agt gat gaa aac att	3323
Val Gly Ser Ser Ile Asn Glu Ile Gly Ser Ser Asp Glu Asn Ile	



1055	1060	1065	
caa gca gaa cta ggt aga aac Gln Ala Glu Leu Gly Arg Asn 1070	aga ggg cca aaa ttg Arg Gly Pro Lys Leu 1075	aat gct atg Asn Ala Met 1080	3368
ctt aga tta ggg gtt ttg caa Leu Arg Leu Gly Val Leu Gln 1085	cct gag gtc tat Pro Glu Val Tyr Lys 1090	aaa caa agt ctt Lys Gln Ser Leu 1095	3413
cct gga agt aat tgt aag cat Pro Gly Ser Asn Cys Lys His 1100	cct gaa ata aaa aag Pro Glu Ile Lys Lys 1105	caa gaa tat Gln Glu Tyr 1110	3458
gaa gaa gta gtt cag act gtt Glu Glu Val Val Gln Thr Val 1115	aat aca gat ttc tct Asn Thr Asp Phe Ser 1120	cca tat ctg Pro Tyr Leu 1125	3503
att tca gat aac tta gaa cag Ile Ser Asp Asn Leu Glu Gln 1130	cct atg gga agt agt Pro Met Gly Ser Ser 1135	cat gca tct His Ala Ser 1140	3548
cag gtt tgt tct gag aca cct Gln Val Cys Ser Glu Thr Pro 1145	gat gac ctg tta gat Asp Asp Leu Leu Asp 1150	gat ggt gaa Asp Gly Glu 1155	3593
ata aag gaa gat act agt ttt Ile Lys Glu Asp Thr Ser Phe 1160	gct gaa aat gac att Ala Glu Asn Asp Ile 1165	aag gaa agt Lys Glu Ser 1170	3638
tct gct gtt ttt agc aaa agc Ser Ala Val Phe Ser Lys Ser 1175	gtc cag aga gga gag Val Gln Arg Gly Glu 1180	ctt agc agg Leu Ser Arg 1185	3683
agt cct agc cct ttc acc cat Ser Pro Ser Pro Phe Thr His 1190	aca cat ttg gct cag Thr His Leu Ala Gln 1195	ggg tac cga Gly Tyr Arg 1200	3728
aga ggg gcc aag aaa tta gag Arg Gly Ala Lys Lys Leu Glu 1205	tcc tca gaa gag aac Ser Ser Glu Glu Asn 1210	tta tct agt Leu Ser Ser 1215	3773
gag gat gaa gag ctt ccc tgc Glu Asp Glu Glu Leu Pro Cys 1220	ttc caa cac ttg tta Phe Gln His Leu Leu 1225	ttt ggt aaa Phe Gly Lys 1230	3818
gta aac aat ata cct tct cag Val Asn Asn Ile Pro Ser Gln 1235	tct act agg cat agc Ser Thr Arg His Ser 1240	acc gtt gct Thr Val Ala 1245	3863
acc gag tgt ctg tct aag aac Thr Glu Cys Leu Ser Lys Asn 1250	aca gag gag aat tta Thr Glu Glu Asn Leu 1255	tta tca ttg Leu Ser Leu 1260	3908
aag aat agc tta aat gac tgc Lys Asn Ser Leu Asn Asp Cys 1265	agt aac cag gta ata Ser Asn Gln Val Ile 1270	ttg gca aag Leu Ala Lys 1275	3953

gca tct	cag gaa cat cac ctt	agt gag gaa aca aaa	tgt tct gct	3998
Ala Ser	Gln Glu His His Leu	Ser Glu Glu Thr Lys	Cys Ser Ala	
1280	1285	1290		
agc ttg	ttt tct tca cag tgc	agt gaa ttg gaa gac	ttg act gca	4043
Ser Leu	Phe Ser Ser Gln Cys	Ser Glu Leu Glu Asp	Leu Thr Ala	
1295	1300	1305		
aat aca	aac acc cag gat cct	ttc ttg att ggt tct	tcc aaa caa	4088
Asn Thr	Asn Thr Gln Asp Pro	Phe Leu Ile Gly Ser	Ser Lys Gln	
1310	1315	1320		
atg agg	cat cag tct gaa agc	cag gga gtt ggt ctg	agt gac aag	4133
Met Arg	His Gln Ser Glu Ser	Gln Gly Val Gly Leu	Ser Asp Lys	
1325	1330	1335		
gaa ttg	gtt tca gat gat gaa	gaa aga gga acg ggc	ttg gaa gaa	4178
Glu Leu	Val Ser Asp Asp Glu	Glu Arg Gly Thr Gly	Leu Glu Glu	
1340	1345	1350		
aat aat	caa gaa gag caa agc	atg gat tca aac tta	ggg gaa gca	4223
Asn Asn	Gln Glu Glu Gln Ser	Met Asp Ser Asn Leu	Gly Glu Ala	
1355	1360	1365		
gca tct	ggg tgt gag agt gaa	aca agc gtc tct gaa	gac tgc tca	4268
Ala Ser	Gly Cys Glu Ser Glu	Thr Ser Val Ser Glu	Asp Cys Ser	
1370	1375	1380		
ggg cta	tcc tct cag agt gac	att tta acc act cag	cag agg gat	4313
Gly Leu	Ser Ser Gln Ser Asp	Ile Leu Thr Thr Gln	Gln Arg Asp	
1385	1390	1395		
acc atg	caa cat aac ctg ata	aag ctc cag cag gaa	atg gct gaa	4358
Thr Met	Gln His Asn Leu Ile	Lys Leu Gln Gln Glu	Met Ala Glu	
1400	1405	1410		
cta gaa	gct gtg tta gaa cag	cat ggg agc cag cct	tct aac agc	4403
Leu Glu	Ala Val Leu Glu Gln	His Gly Ser Gln Pro	Ser Asn Ser	
1415	1420	1425		
tac cct	tcc atc ata agt gac	tcc tct gcc ctt gag	gac ctg cga	4448
Tyr Pro	Ser Ile Ile Ser Asp	Ser Ser Ala Leu Glu	Asp Leu Arg	
1430	1435	1440		
aat cca	gaa caa agc aca tca	gaa aaa gca gta tta	act tca cag	4493
Asn Pro	Glu Gln Ser Thr Ser	Glu Lys Ala Val Leu	Thr Ser Gln	
1445	1450	1455		
aaa agt	agt gaa tac cct ata	agc cag aat cca gaa	ggc ctt tct	4538
Lys Ser	Ser Glu Tyr Pro Ile	Ser Gln Asn Pro Glu	Gly Leu Ser	
1460	1465	1470		
gct gac	aag ttt gag gtg tct	gca gat agt tct acc	agt aaa aat	4583
Ala Asp	Lys Phe Glu Val Ser	Ala Asp Ser Ser Thr	Ser Lys Asn	
1475	1480	1485		

aaa gaa cca gga gtg gaa agg tca tcc cct tct aaa tgc cca tca	4628
Lys Glu Pro Gly Val Glu Arg Ser Ser Pro Ser Lys Cys Pro Ser	
1490 1495 1500	
tta gat gat agg tgg tac atg cac agt tgc tct ggg agt ctt cag	4673
Leu Asp Asp Arg Trp Tyr Met His Ser Cys Ser Gly Ser Leu Gln	
1505 1510 1515	
aat aga aac tac cca tct caa gag gag ctc att aag gtt gtt gat	4718
Asn Arg Asn Tyr Pro Ser Gln Glu Glu Leu Ile Lys Val Val Asp	
1520 1525 1530	
gtg gag gag caa cag ctg gaa gag tct ggg cca cac gat ttg acg	4763
Val Glu Glu Gln Gln Leu Glu Glu Ser Gly Pro His Asp Leu Thr	
1535 1540 1545	
gaa aca tct tac ttg cca agg caa gat cta gag gga acc cct tac	4808
Glu Thr Ser Tyr Leu Pro Arg Gln Asp Leu Glu Gly Thr Pro Tyr	
1550 1555 1560	
ctg gaa tct gga atc agc ctc ttc tct gat gac cct gaa tct gat	4853
Leu Glu Ser Gly Ile Ser Leu Phe Ser Asp Asp Pro Glu Ser Asp	
1565 1570 1575	
cct tct gaa gac aga gcc cca gag tca gct cgt gtt ggc aac ata	4898
Pro Ser Glu Asp Arg Ala Pro Glu Ser Ala Arg Val Gly Asn Ile	
1580 1585 1590	
cca tct tca acc tct gca ttg aaa gtt ccc caa ttg aaa gtt gca	4943
Pro Ser Ser Thr Ser Ala Leu Lys Val Pro Gln Leu Lys Val Ala	
1595 1600 1605	
gaa tct gcc cag ggt cca gct gct gct cat act act gat act gct	4988
Glu Ser Ala Gln Gly Pro Ala Ala Ala His Thr Thr Asp Thr Ala	
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Gly Tyr Asn Ala Met Glu Glu Ser Val Ser Arg Glu Lys Pro Glu	
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Leu Thr Ala Ser Thr Glu Arg Val Asn Lys Arg Met Ser Met Val	
1640 1645 1650	
gtg tct ggc ctg acc cca gaa gaa ttt atg ctc gtg tac aag ttt	5123
Val Ser Gly Leu Thr Pro Glu Glu Phe Met Leu Val Tyr Lys Phe	
1655 1660 1665	
gcc aga aaa cac cac atc act tta act aat cta att act gaa gag	5168
Ala Arg Lys His His Ile Thr Leu Thr Asn Leu Ile Thr Glu Glu	
1670 1675 1680	
act act cat gtt gtt atg aaa aca gat gct gag ttt gtg tgt gaa	5213
Thr Thr His Val Val Met Lys Thr Asp Ala Glu Phe Val Cys Glu	
1685 1690 1695	
cgg aca ctg aaa tat ttt cta gga att gcg gga gga aaa tgg gta	5258

Arg Thr	Leu Lys Tyr Phe Leu	Gly Ile Ala Gly Gly	Lys Trp Val	
1700	1705	1710		
gtt agc	tat ttc tgg gtg acc	cag tct att aaa gaa	aga aaa atg	5303
Val Ser	Tyr Phe Trp Val Thr	Gln Ser Ile Lys Glu	Arg Lys Met	
1715	1720	1725		
ctg aat	gag cat gat ttt gaa	gtc aga gga gat gtg	gtc aat gga	5348
Leu Asn	Glu His Asp Phe Glu	Val Arg Gly Asp Val	Val Asn Gly	
1730	1735	1740		
aga aac	cac caa ggt cca aag	cga gca aga gaa tcc	cag gac aga	5393
Arg Asn	His Gln Gly Pro Lys	Arg Ala Arg Glu Ser	Gln Asp Arg	
1745	1750	1755		
aag atc	ttc agg ggg cta gaa	atc tgt tgc tat ggg	ccc ttc acc	5438
Lys Ile	Phe Arg Gly Leu Glu	Ile Cys Cys Tyr Gly	Pro Phe Thr	
1760	1765	1770		
aac atg	ccc aca gat caa ctg	gaa tgg atg gta cag	ctg tgt ggt	5483
Asn Met	Pro Thr Asp Gln Leu	Glu Trp Met Val Gln	Leu Cys Gly	
1775	1780	1785		
gct tct	gtg gtg aag gag ctt	tca tca ttc acc ctt	ggc aca ggt	5528
Ala Ser	Val Val Lys Glu Leu	Ser Ser Phe Thr Leu	Gly Thr Gly	
1790	1795	1800		
gtc cac	cca att gtg gtt gtg	cag cca gat gcc tgg	aca gag gac	5573
Val His	Pro Ile Val Val Val	Gln Pro Asp Ala Trp	Thr Glu Asp	
1805	1810	1815		
aat ggc	ttc cat gca att ggg	cag atg tgt gag gca	cct gtg gtg	5618
Asn Gly	Phe His Ala Ile Gly	Gln Met Cys Glu Ala	Pro Val Val	
1820	1825	1830		
acc cga	gag tgg gtg ttg gac	agt gta gca ctc tac	cag tgc cag	5663
Thr Arg	Glu Trp Val Leu Asp	Ser Val Ala Leu Tyr	Gln Cys Gln	
1835	1840	1845		
gag ctg	gac acc tac ctg ata	ccc cag atc ccc cac	agc cac tac	5708
Glu Leu	Asp Thr Tyr Leu Ile	Pro Gln Ile Pro His	Ser His Tyr	
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tga				5711

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 Ala Met Gln Lys Ile Leu Glu Cys Pro Ile Cys Leu Glu Leu Ile Lys  
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Glu	Pro	Val	Ser	Thr	Lys	Cys	Asp	His	Ile	Phe	Cys	Lys	Phe	Cys	Met	35	40	45	
Leu	Lys	Leu	Leu	Asn	Gln	Lys	Lys	Gly	Pro	Ser	Gln	Cys	Pro	Leu	Cys	50	55	60	
Lys	Asn	Asp	Ile	Thr	Lys	Arg	Ser	Leu	Gln	Glu	Ser	Thr	Arg	Phe	Ser	65	70	75	80
Gln	Leu	Val	Glu	Glu	Leu	Leu	Lys	Ile	Ile	Cys	Ala	Phe	Gln	Leu	Asp	85	90	95	
Thr	Gly	Leu	Glu	Tyr	Ala	Asn	Ser	Tyr	Asn	Phe	Ala	Lys	Lys	Glu	Asn	100	105	110	
Asn	Ser	Pro	Glu	His	Leu	Lys	Asp	Glu	Val	Ser	Ile	Ile	Gln	Ser	Met	115	120	125	
Gly	Tyr	Arg	Asn	Arg	Ala	Lys	Arg	Leu	Leu	Gln	Ser	Glu	Pro	Glu	Asn	130	135	140	
Pro	Ser	Leu	Gln	Glu	Thr	Ser	Leu	Ser	Val	Gln	Leu	Ser	Asn	Leu	Gly	145	150	155	160
Thr	Val	Arg	Thr	Leu	Arg	Thr	Lys	Gln	Arg	Ile	Gln	Pro	Gln	Lys	Thr	165	170	175	
Ser	Val	Tyr	Ile	Glu	Leu	Gly	Ser	Asp	Ser	Ser	Glu	Asp	Thr	Val	Asn	180	185	190	
Lys	Ala	Thr	Tyr	Cys	Ser	Val	Gly	Asp	Gln	Glu	Leu	Leu	Gln	Ile	Thr	195	200	205	
Pro	Gln	Gly	Thr	Arg	Asp	Glu	Ile	Ser	Leu	Asp	Ser	Ala	Lys	Lys	Ala	210	215	220	
Ala	Cys	Glu	Phe	Ser	Glu	Thr	Asp	Val	Thr	Asn	Thr	Glu	His	His	Gln	225	230	235	240
Pro	Ser	Asn	Asn	Asp	Leu	Asn	Thr	Thr	Glu	Lys	Arg	Ala	Ala	Glu	Arg	245	250	255	
His	Pro	Glu	Lys	Tyr	Gln	Gly	Ser	Ser	Val	Ser	Asn	Leu	His	Val	Glu	260	265	270	
Pro	Cys	Gly	Thr	Asn	Thr	His	Ala	Ser	Ser	Leu	Gln	His	Glu	Asn	Ser	275	280	285	
Ser	Leu	Leu	Leu	Thr	Lys	Asp	Arg	Met	Asn	Val	Glu	Lys	Ala	Glu	Phe	290	295	300	
Cys	Asn	Lys	Ser	Lys	Gln	Pro	Gly	Leu	Ala	Arg	Ser	Gln	His	Asn	Arg	305	310	315	320
Trp	Ala	Gly	Ser	Lys	Glu	Thr	Cys	Asn	Asp	Arg	Arg	Thr	Pro	Ser	Thr	325	330	335	

Glu Lys Lys Val Asp Leu Asn Ala Asp Pro Leu Cys Glu Arg Lys Glu  
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 Trp Asn Lys Gln Lys Leu Pro Cys Ser Glu Asn Pro Arg Asp Thr Glu  
 355 360 365  
 Asp Val Pro Trp Ile Thr Leu Asn Ser Ser Ile Gln Lys Val Asn Glu  
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 Trp Phe Ser Arg Ser Asp Glu Leu Leu Gly Ser Asp Asp Ser His Asp  
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 Gly Glu Ser Glu Ser Asn Ala Lys Val Ala Asp Val Leu Asp Val Leu  
 405 410 415  
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 Ala Ser Asp Pro His Glu Ala Leu Ile Cys Lys Ser Glu Arg Val His  
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 Ser Lys Ser Val Glu Ser Asn Ile Glu Asp Lys Ile Phe Gly Lys Thr  
 450 455 460  
 Tyr Arg Lys Lys Ala Ser Leu Pro Asn Leu Ser His Val Thr Glu Asn  
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 Leu Ile Ile Gly Ala Phe Val Thr Glu Pro Gln Ile Ile Gln Glu Arg  
 485 490 495  
 Pro Leu Thr Asn Lys Leu Lys Arg Lys Arg Arg Pro Thr Ser Gly Leu  
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 His Pro Glu Asp Phe Ile Lys Lys Ala Asp Leu Ala Val Gln Lys Thr  
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 Pro Glu Met Ile Asn Gln Gly Thr Asn Gln Thr Glu Gln Asn Gly Gln  
 530 535 540  
 Val Met Asn Ile Thr Asn Ser Gly His Glu Asn Lys Thr Lys Gly Asp  
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 Ser Ile Gln Asn Glu Lys Asn Pro Asn Pro Ile Glu Ser Leu Glu Lys  
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 Glu Ser Ala Phe Lys Thr Lys Ala Glu Pro Ile Ser Ser Ser Ile Ser  
 580 585 590  
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 595 600 605  
 Asn Arg Leu Arg Arg Lys Ser Ser Thr Arg His Ile His Ala Leu Glu  
 610 615 620  
 Leu Val Val Ser Arg Asn Leu Ser Pro Pro Asn Cys Thr Glu Leu Gln  
 625 630 635 640

Ile Asp Ser Cys Ser Ser Ser Glu Glu Ile Lys Lys Lys Lys Tyr Asn  
 645 650 655  
 Gln Met Pro Val Arg His Ser Arg Asn Leu Gln Leu Met Glu Gly Lys  
 660 665 670  
 Glu Pro Ala Thr Gly Ala Lys Lys Ser Asn Lys Pro Asn Glu Gln Thr  
 675 680 685  
 Ser Lys Arg His Asp Ser Asp Thr Phe Pro Glu Leu Lys Leu Thr Asn  
 690 695 700  
 Ala Pro Gly Ser Phe Thr Lys Cys Ser Asn Thr Ser Glu Leu Lys Glu  
 705 710 715 720  
 Phe Val Asn Pro Ser Leu Pro Arg Glu Glu Lys Glu Glu Lys Leu Glu  
 725 730 735  
 Thr Val Lys Val Ser Asn Asn Ala Glu Asp Pro Lys Asp Leu Met Leu  
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 Ser Gly Glu Arg Val Leu Gln Thr Glu Arg Ser Val Glu Ser Ser Ser  
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 Gly Cys Ser Lys Asp Asn Arg Asn Asp Thr Glu Gly Phe Lys Tyr Pro  
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 1220 1225 1230



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Thr	Glu	Cys	Leu	Ser	Lys	Asn	Thr	Glu	Glu	Asn	Leu	Leu	Ser	Leu
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Lys	Asn	Ser	Leu	Asn	Asp	Cys	Ser	Asn	Gln	Val	Ile	Leu	Ala	Lys
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Ser	Leu	Phe	Ser	Ser	Gln	Cys	Ser	Glu	Leu	Glu	Asp	Leu	Thr	Ala
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Asn	Thr	Asn	Thr	Gln	Asp	Pro	Phe	Leu	Ile	Gly	Ser	Ser	Lys	Gln
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Met	Arg	His	Gln	Ser	Glu	Ser	Gln	Gly	Val	Gly	Leu	Ser	Asp	Lys
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Glu	Leu	Val	Ser	Asp	Asp	Glu	Glu	Arg	Gly	Thr	Gly	Leu	Glu	Glu
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Glu Thr	Ser Tyr Leu Pro Arg	Gln Asp Leu Glu Gly	Thr Pro Tyr
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Leu Glu	Ser Gly Ile Ser Leu	Phe Ser Asp Asp Pro	Glu Ser Asp
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Pro Ser	Glu Asp Arg Ala Pro	Glu Ser Ala Arg Val	Gly Asn Ile
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Pro Ser	Ser Thr Ser Ala Leu	Lys Val Pro Gln Leu	Lys Val Ala
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Glu Ser	Ala Gln Gly Pro Ala	Ala Ala His Thr Thr	Asp Thr Ala
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Gly Tyr	Asn Ala Met Glu Glu	Ser Val Ser Arg Glu	Lys Pro Glu
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Leu Thr	Ala Ser Thr Glu Arg	Val Asn Lys Arg Met	Ser Met Val
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Val Ser	Gly Leu Thr Pro Glu	Glu Phe Met Leu Val	Tyr Lys Phe
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Ala Arg	Lys His His Ile Thr	Leu Thr Asn Leu Ile	Thr Glu Glu
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Thr Thr	His Val Val Met Lys	Thr Asp Ala Glu Phe	Val Cys Glu
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Arg Thr	Leu Lys Tyr Phe Leu	Gly Ile Ala Gly Gly	Lys Trp Val
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Val Ser	Tyr Phe Trp Val Thr	Gln Ser Ile Lys Glu	Arg Lys Met
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Leu Asn	Glu His Asp Phe Glu	Val Arg Gly Asp Val	Val Asn Gly
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Arg Asn	His Gln Gly Pro Lys	Arg Ala Arg Glu Ser	Gln Asp Arg
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Lys Ile	Phe Arg Gly Leu Glu	Ile Cys Cys Tyr Gly	Pro Phe Thr
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Asn Met	Pro Thr Asp Gln Leu	Glu Trp Met Val Gln	Leu Cys Gly
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Ala Ser	Val Val Lys Glu Leu	Ser Ser Phe Thr Leu	Gly Thr Gly
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Thr	Arg	Glu	Trp	Val	Leu	Asp	Ser	Val	Ala	Leu	Tyr	Gln	Cys	Gln
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Glu Pro Val Ser Thr Lys Cys Asp His Ile Phe Cys Lys Phe Cys Met	
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Leu Lys Leu Leu Asn Gln Lys Lys Gly Pro Ser Gln Cys Pro Leu Cys	
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Gln Leu Val Glu Glu Leu Leu Lys Ile Ile Cys Ala Phe Gln Leu Asp	
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Trp	Phe	Ser	Arg	Ser	Asp	Glu	Leu	Leu	Gly	Ser	Asp	Asp	Ser	His	Asp		
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Glu Glu Val Val Gln Thr Val Asn Thr Asp Phe Ser Pro Tyr Leu	
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att tca gat aac tta gaa cag cct atg gga agt agt cat gca tct	3548
Ile Ser Asp Asn Leu Glu Gln Pro Met Gly Ser Ser His Ala Ser	
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Gln Val Cys Ser Glu Thr Pro Asp Asp Leu Leu Asp Asp Gly Glu	
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ata aag gaa gat act agt ttt gct gaa aat gac att aag gaa agt	3638
Ile Lys Glu Asp Thr Ser Phe Ala Glu Asn Asp Ile Lys Glu Ser	
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Ser Ala Val Phe Ser Lys Ser Val Gln Arg Gly Glu Leu Ser Arg	
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agt cct agc cct ttc acc cat aca cat ttg gct cag ggt tac cga	3728
Ser Pro Ser Pro Phe Thr His Thr His Leu Ala Gln Gly Tyr Arg	
1190 1195 1200	
aga ggg gcc aag aaa tta gag tcc tca gaa gag aac tta tct agt	3773
Arg Gly Ala Lys Lys Leu Glu Ser Ser Glu Glu Asn Leu Ser Ser	
1205 1210 1215	
gag gat gaa gag ctt ccc tgc ttc caa cac ttg tta ttt ggt aaa	3818
Glu Asp Glu Glu Leu Pro Cys Phe Gln His Leu Leu Phe Gly Lys	
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gta aac aat ata cct tct cag tct act agg cat agc acc gtt gct	3863



Val Asn Asn Ile Pro Ser Gln Ser Thr Arg His Ser Thr Val Ala	
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acc gag tgt ctg tct aag aac aca gag gag aat tta tta tca ttg	3908
Thr Glu Cys Leu Ser Lys Asn Thr Glu Glu Asn Leu Leu Ser Leu	
1250 1255 1260	
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Lys Asn Ser Leu Asn Asp Cys Ser Asn Gln Val Ile Leu Ala Lys	
1265 1270 1275	
gca tct cag gaa cat cac ctt agt gag gaa aca aaa ttg tct gct	3998
Ala Ser Gln Glu His His Leu Ser Glu Glu Thr Lys Cys Ser Ala	
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agc ttg ttt tct tca cag tgc agt gaa ttg gaa gac ttg act gca	4043
Ser Leu Phe Ser Ser Gln Cys Ser Glu Leu Glu Asp Leu Thr Ala	
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Asn Thr Asn Thr Gln Asp Pro Phe Leu Ile Gly Ser Ser Lys Gln	
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Met Arg His Gln Ser Glu Ser Gln Gly Val Gly Leu Ser Asp Lys	
1325 1330 1335	
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Glu Leu Val Ser Asp Asp Glu Glu Arg Gly Thr Gly Leu Glu Glu	
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Asn Asn Gln Glu Glu Gln Ser Met Asp Ser Asn Leu Gly Glu Ala	
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Ala Ser Gly Cys Glu Ser Glu Thr Ser Val Ser Glu Asp Cys Ser	
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Gly Leu Ser Ser Gln Ser Asp Ile Leu Thr Thr Gln Gln Arg Asp	
1385 1390 1395	
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Thr Met Gln His Asn Leu Ile Lys Leu Gln Gln Glu Met Ala Glu	
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Leu Glu Ala Val Leu Glu Gln His Gly Ser Gln Pro Ser Asn Ser	
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Tyr Pro Ser Ile Ile Ser Asp Ser Ser Ala Leu Glu Asp Leu Arg	
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Asn Pro Glu Gln Ser Thr Ser Glu Lys Ala Val Leu Thr Ser Gln	

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Lys Ser Ser Glu Tyr Pro Ile Ser Gln Asn Pro Glu Gly Leu Ser			
1460	1465	1470	
gct gac aag ttt gag gtg tct gca gat agt tct acc agt aaa aat			4583
Ala Asp Lys Phe Glu Val Ser Ala Asp Ser Ser Thr Ser Lys Asn			
1475	1480	1485	
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Lys Glu Pro Gly Val Glu Arg Ser Ser Pro Ser Lys Cys Pro Ser			
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Leu Asp Asp Arg Trp Tyr Met His Ser Cys Ser Gly Ser Leu Gln			
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Asn Arg Asn Tyr Pro Ser Gln Glu Glu Leu Ile Lys Val Val Asp			
1520	1525	1530	
gtg gag gag caa cag ctg gaa gag tct ggg cca cac gat ttg acg			4763
Val Glu Glu Gln Gln Leu Glu Glu Ser Gly Pro His Asp Leu Thr			
1535	1540	1545	
gaa aca tct tac ttg cca agg caa gat cta gag gga acc cct tac			4808
Glu Thr Ser Tyr Leu Pro Arg Gln Asp Leu Glu Gly Thr Pro Tyr			
1550	1555	1560	
ctg gaa tct gga atc agc ctc ttc tct gat gac cct gaa tct gat			4853
Leu Glu Ser Gly Ile Ser Leu Phe Ser Asp Asp Pro Glu Ser Asp			
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cct tct gaa gac aga gcc cca gag tca gct cgt gtt ggc aac ata			4898
Pro Ser Glu Asp Arg Ala Pro Glu Ser Ala Arg Val Gly Asn Ile			
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Pro Ser Ser Thr Ser Ala Leu Lys Val Pro Gln Leu Lys Val Ala			
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Glu Ser Ala Gln Gly Pro Ala Ala Ala His Thr Thr Asp Thr Ala			
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Gly Tyr Asn Ala Met Glu Glu Ser Val Ser Arg Glu Lys Pro Glu			
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Leu Thr Ala Ser Thr Glu Arg Val Asn Lys Arg Met Ser Met Val			
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Val Ser Gly Leu Thr Pro Glu Glu Phe Met Leu Val Tyr Lys Phe			
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Ala Arg	Lys His His Ile Thr	Leu Thr Asn Leu Ile	Thr Glu Glu	
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act act	cat gtt gtt atg aaa	aca gat gct gag ttt	gtg tgt gaa	5213
Thr Thr	His Val Val Met Lys	Thr Asp Ala Glu Phe	Val Cys Glu	
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cgg aca	ctg aaa tat ttt cta	gga att gcg gga gga	aaa tgg gta	5258
Arg Thr	Leu Lys Tyr Phe Leu	Gly Ile Ala Gly Gly	Lys Trp Val	
1700	1705	1710		
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Val Ser	Tyr Phe Trp Val Thr	Gln Ser Ile Lys Glu	Arg Lys Met	
1715	1720	1725		
ctg aat	gag cat gat ttt gaa	gtc aga gga gat gtg	gtc aat gga	5348
Leu Asn	Glu His Asp Phe Glu	Val Arg Gly Asp Val	Val Asn Gly	
1730	1735	1740		
aga aac	cac caa ggt cca aag	cga gca aga gaa tcc	cag gac aga	5393
Arg Asn	His Gln Gly Pro Lys	Arg Ala Arg Glu Ser	Gln Asp Arg	
1745	1750	1755		
aag atc	ttc agg ggg cta gaa	atc tgt tgc tat ggg	ccc ttc acc	5438
Lys Ile	Phe Arg Gly Leu Glu	Ile Cys Cys Tyr Gly	Pro Phe Thr	
1760	1765	1770		
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Asn Met	Pro Thr Asp Gln Leu	Glu Trp Met Val Gln	Leu Cys Gly	
1775	1780	1785		
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Ala Ser	Val Val Lys Glu Leu	Ser Ser Phe Thr Leu	Gly Thr Gly	
1790	1795	1800		
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Val His	Pro Ile Val Val Val	Gln Pro Asp Ala Trp	Thr Glu Asp	
1805	1810	1815		
aat ggc	ttc cat gca att ggg	cag atg tgt gag gca	cct gtg gtg	5618
Asn Gly	Phe His Ala Ile Gly	Gln Met Cys Glu Ala	Pro Val Val	
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acc cga	gag tgg gtg ttg gac	agt gta gca ctc tac	cag tgc cag	5663
Thr Arg	Glu Trp Val Leu Asp	Ser Val Ala Leu Tyr	Gln Cys Gln	
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Glu Leu	Asp Thr Tyr Leu Ile	Pro Gln Ile Pro His	Ser His Tyr	
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tga				5711

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<211> 1863

<212> PRT

<213> Homo sapiens

<400> 266

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Ala Met Gln Lys Ile Leu Glu Cys Pro Ile Cys Leu Glu Leu Ile Lys  
20 25 30

Glu Pro Val Ser Thr Lys Cys Asp His Ile Phe Cys Lys Phe Cys Met  
35 40 45

Leu Lys Leu Leu Asn Gln Lys Lys Gly Pro Ser Gln Cys Pro Leu Cys  
50 55 60

Lys Asn Asp Ile Thr Lys Arg Ser Leu Gln Glu Ser Thr Arg Phe Ser  
65 70 75 80

Gln Leu Val Glu Glu Leu Leu Lys Ile Ile Cys Ala Phe Gln Leu Asp  
85 90 95

Thr Gly Leu Glu Tyr Ala Asn Ser Tyr Asn Phe Ala Lys Lys Glu Asn  
100 105 110

Asn Ser Pro Glu His Leu Lys Asp Glu Val Ser Ile Ile Gln Ser Met  
115 120 125

Gly Tyr Arg Asn Arg Ala Lys Arg Leu Leu Gln Ser Glu Pro Glu Asn  
130 135 140

Pro Ser Leu Gln Glu Thr Ser Leu Ser Val Gln Leu Ser Asn Leu Gly  
145 150 155 160

Thr Val Arg Thr Leu Arg Thr Lys Gln Arg Ile Gln Pro Gln Lys Thr  
165 170 175

Ser Val Tyr Ile Glu Leu Gly Ser Asp Ser Ser Glu Asp Thr Val Asn  
180 185 190

Lys Ala Thr Tyr Cys Ser Val Gly Asp Gln Glu Leu Leu Gln Ile Thr  
195 200 205

Pro Gln Gly Thr Arg Asp Glu Ile Ser Leu Asp Ser Ala Lys Lys Ala  
210 215 220

Ala Cys Glu Phe Ser Glu Thr Asp Val Thr Asn Thr Glu His His Gln  
225 230 235 240

Pro Ser Asn Asn Asp Leu Asn Thr Thr Glu Lys Arg Ala Ala Glu Arg  
245 250 255

His Pro Glu Lys Tyr Gln Gly Ser Ser Val Ser Asn Leu His Val Glu  
260 265 270

Pro Cys Gly Thr Asn Thr His Ala Ser Ser Leu Gln His Glu Asn Ser

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Ser	Leu	Leu	Leu	Thr	Lys	Asp	Arg	Met	Asn	Val	Glu	Lys	Ala	Glu	Phe
290					295					300					
Cys	Asn	Lys	Ser	Lys	Gln	Pro	Gly	Leu	Ala	Arg	Ser	Gln	His	Asn	Arg
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Trp	Ala	Gly	Ser	Lys	Glu	Thr	Cys	Asn	Asp	Arg	Arg	Thr	Pro	Ser	Thr
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Glu	Lys	Lys	Val	Asp	Leu	Asn	Ala	Asp	Pro	Leu	Cys	Glu	Arg	Lys	Glu
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Trp	Asn	Lys	Gln	Lys	Leu	Pro	Cys	Ser	Glu	Asn	Pro	Arg	Asp	Thr	Glu
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Asp	Val	Pro	Trp	Ile	Thr	Leu	Asn	Ser	Ser	Ile	Gln	Lys	Val	Asn	Glu
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Trp	Phe	Ser	Arg	Ser	Asp	Glu	Leu	Leu	Gly	Ser	Asp	Asp	Ser	His	Asp
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Gly	Glu	Ser	Glu	Ser	Asn	Ala	Lys	Val	Ala	Asp	Val	Leu	Asp	Val	Leu
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Asn	Glu	Val	Asp	Glu	Tyr	Ser	Gly	Ser	Ser	Glu	Lys	Ile	Asp	Leu	Leu
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Ala	Ser	Asp	Pro	His	Glu	Ala	Leu	Ile	Cys	Lys	Ser	Glu	Arg	Val	His
435					440					445					
Ser	Lys	Ser	Val	Glu	Ser	Asn	Ile	Glu	Asp	Lys	Ile	Phe	Gly	Lys	Thr
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Tyr	Arg	Lys	Lys	Ala	Ser	Leu	Pro	Asn	Leu	Ser	His	Val	Thr	Glu	Asn
465					470					475		480			
Leu	Ile	Ile	Gly	Ala	Phe	Val	Thr	Glu	Pro	Gln	Ile	Ile	Gln	Glu	Arg
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Pro	Leu	Thr	Asn	Lys	Leu	Lys	Arg	Lys	Arg	Arg	Pro	Thr	Ser	Gly	Leu
500					505					510					
His	Pro	Glu	Asp	Phe	Ile	Lys	Lys	Ala	Asp	Leu	Ala	Val	Gln	Lys	Thr
515					520					525					
Pro	Glu	Met	Ile	Asn	Gln	Gly	Thr	Asn	Gln	Thr	Glu	Gln	Asn	Gly	Gln
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Val	Met	Asn	Ile	Thr	Asn	Ser	Gly	His	Glu	Asn	Lys	Thr	Lys	Gly	Asp
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Ser	Ile	Gln	Asn	Glu	Lys	Asn	Pro	Asn	Pro	Ile	Glu	Ser	Leu	Glu	Lys
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Glu	Ser	Ala	Phe	Lys	Thr	Lys	Ala	Glu	Pro	Ile	Ser	Ser	Ser	Ile	Ser

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Asn	Arg	Leu	Arg	Arg	Lys	Ser	Ser	Thr	Arg	His	Ile	His	Ala	Leu	Glu	
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Leu	Val	Val	Ser	Arg	Asn	Leu	Ser	Pro	Pro	Asn	Cys	Thr	Glu	Leu	Gln	
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Ile	Asp	Ser	Cys	Ser	Ser	Ser	Glu	Glu	Ile	Lys	Lys	Lys	Lys	Tyr	Asn	
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Gln	Met	Pro	Val	Arg	His	Ser	Arg	Asn	Leu	Gln	Leu	Met	Glu	Gly	Lys	
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Glu	Pro	Ala	Thr	Gly	Ala	Lys	Lys	Ser	Asn	Lys	Pro	Asn	Glu	Gln	Thr	
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Ser	Lys	Arg	His	Asp	Ser	Asp	Thr	Phe	Pro	Glu	Leu	Lys	Leu	Thr	Asn	
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Ala	Pro	Gly	Ser	Phe	Thr	Lys	Cys	Ser	Asn	Thr	Ser	Glu	Leu	Lys	Glu	
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Phe	Val	Asn	Pro	Ser	Leu	Pro	Arg	Glu	Glu	Lys	Glu	Glu	Lys	Leu	Glu	
725					730					735						
Thr	Val	Lys	Val	Ser	Asn	Asn	Ala	Glu	Asp	Pro	Lys	Asp	Leu	Met	Leu	
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Ser	Gly	Glu	Arg	Val	Leu	Gln	Thr	Glu	Arg	Ser	Val	Glu	Ser	Ser	Ser	
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Ile	Ser	Leu	Val	Pro	Gly	Thr	Asp	Tyr	Gly	Thr	Gln	Glu	Ser	Ile	Ser	
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785					790					795					800	
Cys	Val	Ser	Gln	Cys	Ala	Ala	Phe	Glu	Asn	Pro	Lys	Gly	Leu	Ile	His	
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Gly	Cys	Ser	Lys	Asp	Asn	Arg	Asn	Asp	Thr	Glu	Gly	Phe	Lys	Tyr	Pro	
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Ser	Ile	Lys	Gly	Gly	Ser	Arg	Phe	Cys	Leu	Ser	Ser	Gln	Phe	Arg	Gly				
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Pro	Tyr	Arg	Ile	Pro	Pro	Leu	Phe	Pro	Ile	Lys	Ser	Phe	Val	Lys	Thr				
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Lys	Cys	Lys	Lys	Asn	Leu	Leu	Glu	Glu	Asn	Phe	Glu	Glu	His	Ser	Met				
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Pro	Gly	Ser	Asn	Cys	Lys	His	Pro	Glu	Ile	Lys	Lys	Gln	Glu	Tyr					
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Arg Gly 1205	Ala Lys Lys Leu Glu 1210	Ser Ser Glu Glu Asn Leu Ser Ser 1215
Glu Asp 1220	Glu Glu Leu Pro Cys 1225	Phe Gln His Leu Leu Phe Gly Lys 1230
Val Asn 1235	Asn Ile Pro Ser Gln 1240	Ser Thr Arg His Ser Thr Val Ala 1245
Thr Glu 1250	Cys Leu Ser Lys Asn 1255	Thr Glu Glu Asn Leu Leu Ser Leu 1260
Lys Asn 1265	Ser Leu Asn Asp Cys 1270	Ser Asn Gln Val Ile Leu Ala Lys 1275
Ala Ser 1280	Gln Glu His His Leu 1285	Ser Glu Glu Thr Lys Cys Ser Ala 1290
Ser Leu 1295	Phe Ser Ser Gln Cys 1300	Ser Glu Leu Glu Asp Leu Thr Ala 1305
Asn Thr 1310	Asn Thr Gln Asp Pro 1315	Phe Leu Ile Gly Ser Ser Lys Gln 1320
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Glu Leu 1340	Val Ser Asp Asp Glu 1345	Glu Arg Gly Thr Gly Leu Glu Glu 1350
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Ala Ser 1370	Gly Cys Glu Ser Glu 1375	Thr Ser Val Ser Glu Asp Cys Ser 1380
Gly Leu 1385	Ser Ser Gln Ser Asp 1390	Ile Leu Thr Thr Gln Gln Arg Asp 1395
Thr Met 1400	Gln His Asn Leu Ile 1405	Lys Leu Gln Gln Glu Met Ala Glu 1410
Leu Glu 1415	Ala Val Leu Glu Gln 1420	His Gly Ser Gln Pro Ser Asn Ser 1425
Tyr Pro 1430	Ser Ile Ile Ser Asp 1435	Ser Ser Ala Leu Glu Asp Leu Arg 1440
Asn Pro 1445	Glu Gln Ser Thr Ser 1450	Glu Lys Ala Val Leu Thr Ser Gln 1455
Lys Ser	Ser Glu Tyr Pro Ile	Ser Gln Asn Pro Glu Gly Leu Ser



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Val Glu Glu Gln Gln Leu Glu	Glu Ser Gly Pro His Asp Leu Thr			
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Glu Thr Ser Tyr Leu Pro Arg	Gln Asp Leu Glu Gly Thr Pro Tyr			
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Leu Glu Ser Gly Ile Ser Leu	Phe Ser Asp Asp Pro Glu Ser Asp			
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Pro Ser Glu Asp Arg Ala Pro	Glu Ser Ala Arg Val Gly Asn Ile			
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Glu Ser Ala Gln Gly Pro Ala	Ala Ala His Thr Thr Asp Thr Ala			
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Val Ser Gly Leu Thr Pro Glu	Glu Phe Met Leu Val Tyr Lys Phe			
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Ala Arg Lys His His Ile Thr	Leu Thr Asn Leu Ile Thr Glu Glu			
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1685	1690	1695		
Arg Thr Leu Lys Tyr Phe Leu	Gly Ile Ala Gly Gly Lys Trp Val			
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Val Ser Tyr Phe Trp Val Thr	Gln Ser Ile Lys Glu Arg Lys Met			
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Lys Ile Phe Arg Gly Leu Glu Ile Cys Cys Tyr Gly Pro Phe Thr				
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Asn Met Pro Thr Asp Gln Leu Glu Trp Met Val Gln Leu Cys Gly				
1775		1780		1785
Ala Ser Val Val Lys Glu Leu Ser Ser Phe Thr Leu Gly Thr Gly				
1790		1795		1800
Val His Pro Ile Val Val Val Gln Pro Asp Ala Trp Thr Glu Asp				
1805		1810		1815
Asn Gly Phe His Ala Ile Gly Gln Met Cys Glu Ala Pro Val Val				
1820		1825		1830
Thr Arg Glu Trp Val Leu Asp Ser Val Ala Leu Tyr Gln Cys Gln				
1835		1840		1845
Glu Leu Asp Thr Tyr Leu Ile Pro Gln Ile Pro His Ser His Tyr				
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atg gat tta tct gct ctt cgc gtt gaa gaa gta caa aat gtc att aat	167
Met Asp Leu Ser Ala Leu Arg Val Glu Glu Val Gln Asn Val Ile Asn	
1 5 10 15	
gct atg cag aaa atc tta gag tgt ccc atc tgt ctg gag ttg atc aag	215
Ala Met Gln Lys Ile Leu Glu Cys Pro Ile Cys Leu Glu Leu Ile Lys	
20 25 30	
gaa cct gtc tcc aca aag tgt gac cac ata ttt tgc aaa ttt tgc atg	263
Glu Pro Val Ser Thr Lys Cys Asp His Ile Phe Cys Lys Phe Cys Met	
35 40 45	
ctg aaa ctt ctc aac cag aag aaa ggg cct tca cag tgt cct tta tgt	311
Leu Lys Leu Leu Asn Gln Lys Lys Gly Pro Ser Gln Cys Pro Leu Cys	
50 55 60	
aag aat gat ata acc aaa agg agc cta caa gaa agt acg aga ttt agt	359
Lys Asn Asp Ile Thr Lys Arg Ser Leu Gln Glu Ser Thr Arg Phe Ser	

65	70	75	80	
caa ctt gtt gaa gag cta ttg aaa atc att tgt gct ttt cag ctt gac				407
Gln Leu Val Glu Glu Leu Leu Lys Ile Ile Cys Ala Phe Gln Leu Asp	85	90	95	
aca ggt ttg gag tat gca aac agc tat aat ttt gca aaa aag gaa aat				455
Thr Gly Leu Glu Tyr Ala Asn Ser Tyr Asn Phe Ala Lys Lys Glu Asn	100	105	110	
aac tct cct gaa cat cta aaa gat gaa gtt tct atc atc caa agt atg				503
Asn Ser Pro Glu His Leu Lys Asp Glu Val Ser Ile Ile Gln Ser Met	115	120	125	
ggc tac aga aac cgt gcc aaa aga ctt cta cag agt gaa ccc gaa aat				551
Gly Tyr Arg Asn Arg Ala Lys Arg Leu Leu Gln Ser Glu Pro Glu Asn	130	135	140	
cct tcc ttg cag gaa acc agt ctc agt gtc caa ctc tct aac ctt gga				599
Pro Ser Leu Gln Glu Thr Ser Leu Ser Val Gln Leu Ser Asn Leu Gly	145	150	155	160
act gtg aga act ctg agg aca aag cag cgg ata caa cct caa aag acg				647
Thr Val Arg Thr Leu Arg Thr Lys Gln Arg Ile Gln Pro Gln Lys Thr	165	170	175	
tct gtc tac att gaa ttg gga tct gat tct tct gaa gat acc gtt aat				695
Ser Val Tyr Ile Glu Leu Gly Ser Asp Ser Ser Glu Asp Thr Val Asn	180	185	190	
aag gca act tat tgc agt gtg gga gat caa gaa ttg tta caa atc acc				743
Lys Ala Thr Tyr Cys Ser Val Gly Asp Gln Glu Leu Leu Gln Ile Thr	195	200	205	
cct caa gga acc agg gat gaa atc agt ttg gat tct gca aaa aag gct				791
Pro Gln Gly Thr Arg Asp Glu Ile Ser Leu Asp Ser Ala Lys Lys Ala	210	215	220	
gct tgt gaa ttt tct gag acg gat gta aca aat act gaa cat cat caa				839
Ala Cys Glu Phe Ser Glu Thr Asp Val Thr Asn Thr Glu His His Gln	225	230	235	240
ccc agt aat aat gat ttg aac acc act gag aag cgt gca gct gag agg				887
Pro Ser Asn Asn Asp Leu Asn Thr Thr Glu Lys Arg Ala Ala Glu Arg	245	250	255	
cat cca gaa aag tat cag ggt agt tct gtt tca aac ttg cat gtg gag				935
His Pro Glu Lys Tyr Gln Gly Ser Ser Val Ser Asn Leu His Val Glu	260	265	270	
cca tgt ggc aca aat act cat gcc agc tca tta cag cat gag aac agc				983
Pro Cys Gly Thr Asn Thr His Ala Ser Ser Leu Gln His Glu Asn Ser	275	280	285	
agt tta tta ctc act aaa gac aga atg aat gta gaa aag gct gaa ttc				1031
Ser Leu Leu Leu Thr Lys Asp Arg Met Asn Val Glu Lys Ala Glu Phe	290	295	300	

tgt aat aaa agc aaa cag cct ggc tta gca agg agc caa cat aac aga Cys Asn Lys Ser Lys Gln Pro Gly Leu Ala Arg Ser Gln His Asn Arg 305 310 315 320	1079
tgg gct gga agt aag gaa aca tgt aat gat agg cgg act ccc agc aca Trp Ala Gly Ser Lys Glu Thr Cys Asn Asp Arg Arg Thr Pro Ser Thr 325 330 335	1127
gaa aaa aag gta gat ctg aat gct gat ccc ctg tgt gag aga aaa gaa Glu Lys Lys Val Asp Leu Asn Ala Asp Pro Leu Cys Glu Arg Lys Glu 340 345 350	1175
tgg aat aag cag aaa ctg cca tgc tca gag aat cct aga gat act gaa Trp Asn Lys Gln Lys Leu Pro Cys Ser Glu Asn Pro Arg Asp Thr Glu 355 360 365	1223
gat gtt cct tgg ata aca cta aat agc agc att cag aaa gtt aat gag Asp Val Pro Trp Ile Thr Leu Asn Ser Ser Ile Gln Lys Val Asn Glu 370 375 380	1271
tgg ttt tcc aga agt gat gaa ctg tta ggt tct gat gac tca cat gat Trp Phe Ser Arg Ser Asp Glu Leu Leu Gly Ser Asp Asp Ser His Asp 385 390 395 400	1319
ggg gag tct gaa tca aat gcc aaa gta gct gat gta ttg gac gtt cta Gly Glu Ser Glu Ser Asn Ala Lys Val Ala Asp Val Leu Asp Val Leu 405 410 415	1367
aat gag gta gat gaa tat tct ggt tct tca gag aaa ata gac tta ctg Asn Glu Val Asp Glu Tyr Ser Gly Ser Ser Glu Lys Ile Asp Leu Leu 420 425 430	1415
gcc agt gat cct cat gag gct tta ata tgt aaa agt gaa aga gtt cac Ala Ser Asp Pro His Glu Ala Leu Ile Cys Lys Ser Glu Arg Val His 435 440 445	1463
tcc aaa tca gta gag agt aat att gaa gac aaa ata ttt ggg aaa acc Ser Lys Ser Val Glu Ser Asn Ile Glu Asp Lys Ile Phe Gly Lys Thr 450 455 460	1511
tat cgg aag aag gca agc ctc ccc aac tta agc cat gta act gaa aat Tyr Arg Lys Lys Ala Ser Leu Pro Asn Leu Ser His Val Thr Glu Asn 465 470 475 480	1559
cta att ata gga gca ttt gtt act gag cca cag ata ata caa gag cgt Leu Ile Ile Gly Ala Phe Val Thr Glu Pro Gln Ile Ile Gln Glu Arg 485 490 495	1607
ccc ctc aca aat aaa tta aag cgt aaa agg aga cct aca tca ggc ctt Pro Leu Thr Asn Lys Leu Lys Arg Lys Arg Arg Pro Thr Ser Gly Leu 500 505 510	1655
cat cct gag gat ttt atc aag aaa gca gat ttg gca gtt caa aag act His Pro Glu Asp Phe Ile Lys Lys Ala Asp Leu Ala Val Gln Lys Thr 515 520 525	1703

cct gaa atg ata aat cag gga act aac caa acg gag cag aat ggt caa	1751
Pro Glu Met Ile Asn Gln Gly Thr Asn Gln Thr Glu Gln Asn Gly Gln	
530 535 540	
gtg atg aat att act aat agt ggt cat gag aat aaa aca aaa ggt gat	1799
Val Met Asn Ile Thr Asn Ser Gly His Glu Asn Lys Thr Lys Gly Asp	
545 550 555 560	
tct att cag aat gag aaa aat cct aac cca ata gaa tca ctc gaa aaa	1847
Ser Ile Gln Asn Glu Lys Asn Pro Asn Pro Ile Glu Ser Leu Glu Lys	
565 570 575	
gaa tct gct ttc aaa acg aaa gct gaa cct ata agc agc agt ata agc	1895
Glu Ser Ala Phe Lys Thr Lys Ala Glu Pro Ile Ser Ser Ser Ile Ser	
580 585 590	
aat atg gaa ctc gaa tta aat atc cac aat tca aaa gca cct aaa aag	1943
Asn Met Glu Leu Glu Leu Asn Ile His Asn Ser Lys Ala Pro Lys Lys	
595 600 605	
aat agg ctg agg agg aag tct tct acc agg cat att cat gcg ctt gaa	1991
Asn Arg Leu Arg Arg Lys Ser Ser Thr Arg His Ile His Ala Leu Glu	
610 615 620	
cta gta gtc agt aga aat cta agc cca cct aat tgt act gaa ttg caa	2039
Leu Val Val Ser Arg Asn Leu Ser Pro Pro Asn Cys Thr Glu Leu Gln	
625 630 635 640	
att gat agt tgt tct agc agt gaa gag ata aag aaa aaa aag tac aac	2087
Ile Asp Ser Cys Ser Ser Ser Glu Glu Ile Lys Lys Lys Lys Tyr Asn	
645 650 655	
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Gln Met Pro Val Arg His Ser Arg Asn Leu Gln Leu Met Glu Gly Lys	
660 665 670	
gaa cct gca act gga gcc aag aag agt aac aag cca aat gaa cag aca	2183
Glu Pro Ala Thr Gly Ala Lys Lys Ser Asn Lys Pro Asn Glu Gln Thr	
675 680 685	
agt aaa aga cat gac agc gat act ttc cca gag ctg aag tta aca aat	2231
Ser Lys Arg His Asp Ser Asp Thr Phe Pro Glu Leu Lys Leu Thr Asn	
690 695 700	
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Ala Pro Gly Ser Phe Thr Lys Cys Ser Asn Thr Ser Glu Leu Lys Glu	
705 710 715 720	
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Phe Val Asn Pro Ser Leu Pro Arg Glu Glu Lys Glu Glu Lys Leu Gln	
725 730 735	
aca gtt aaa gtg tct aat aat gct gaa gac ccc aaa gat ctc atg tta	2375
Thr Val Lys Val Ser Asn Asn Ala Glu Asp Pro Lys Asp Leu Met Leu	
740 745 750	
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Ser Gly Glu Arg Val Leu Gln Thr Glu Arg Ser Val Glu Ser Ser Ser  
 755 760 765  
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 Ile Ser Leu Val Pro Gly Thr Asp Tyr Gly Thr Gln Glu Ser Ile Ser  
 770 775 780  
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 785 790 795 800  
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 Cys Val Ser Gln Cys Ala Ala Phe Glu Asn Pro Lys Gly Leu Ile His  
 805 810 815  
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 Gly Cys Ser Lys Asp Asn Arg Asn Asp Thr Glu Gly Phe Lys Tyr Pro  
 820 825 830  
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 Leu Gly His Glu Val Asn His Ser Arg Glu Thr Ser Ile Glu Met Glu  
 835 840 845  
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 Glu Ser Glu Leu Asp Ala Gln Tyr Leu Gln Asn Thr Phe Lys Val Ser  
 850 855 860  
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 Lys Arg Gln Ser Phe Ala Leu Phe Ser Asn Pro Gly Asn Ala Glu Glu  
 865 870 875 880  
 gaa tgt gca aca ttc tct gcc cac tct ggg tcc tta aag aaa caa agt 2807  
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 885 890 895  
 cca aaa gtc act ttt gaa tgt gaa caa aag gaa gaa aat caa gga aag 2855  
 Pro Lys Val Thr Phe Glu Cys Glu Gln Lys Glu Glu Asn Gln Gly Lys  
 900 905 910  
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 Asn Glu Ser Asn Ile Lys Pro Val Gln Thr Val Asn Ile Thr Ala Gly  
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 Phe Pro Val Val Gly Gln Lys Asp Lys Pro Val Asp Asn Ala Lys Cys  
 930 935 940  
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 Ser Ile Lys Gly Gly Ser Arg Phe Cys Leu Ser Ser Gln Phe Arg Gly  
 945 950 955 960  
 aac gaa act gga ctc att act cca aat aaa cat gga ctt tta caa aac 3047  
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 965 970 975  
 cca tat cgt ata cca cca ctt ttt ccc atc aag tca ttt gtt aaa act 3095  
 Pro Tyr Arg Ile Pro Pro Leu Phe Pro Ile Lys Ser Phe Val Lys Thr

980					985					990					
aaa tgt aag aaa aat ctg cta gag	gaa aac ttt gag gaa cat tca atg	3143													
Lys Cys Lys Lys Asn Leu Leu Glu	Glu Asn Phe Glu Glu His Ser Met														
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Ser Pro Glu Arg Glu Met Gly	Asn Glu Asn Ile Pro Ser Thr Val														
1010	1015	1020													
agc aca att agc cgt aat aac	att aga gaa aat gtt ttt aaa gaa	3233													
Ser Thr Ile Ser Arg Asn Asn	Ile Arg Glu Asn Val Phe Lys Glu														
1025	1030	1035													
gcc agc tca agc aat att aat	gaa gta ggt tcc agt act aat gaa	3278													
Ala Ser Ser Ser Asn Ile Asn	Glu Val Gly Ser Ser Thr Asn Glu														
1040	1045	1050													
gtg ggc tcc agt att aat gaa	ata ggt tcc agt gat gaa aac att	3323													
Val Gly Ser Ser Ile Asn Glu	Ile Gly Ser Ser Asp Glu Asn Ile														
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Gln Ala Glu Leu Gly Arg Asn	Arg Gly Pro Lys Leu Asn Ala Met														
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Pro Gly Ser Asn Cys Lys His	Pro Glu Ile Lys Lys Gln Glu Tyr														
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Ser Ala Val Phe Ser Lys Ser	Val Gln Lys Gly Glu Leu Ser Arg														
1175	1180	1185													
agt cct agc cct ttc acc cat	aca cat ttg gct cag ggt tac cga	3728													
Ser Pro Ser Pro Phe Thr His	Thr His Leu Ala Gln Gly Tyr Arg														
1190	1195	1200													

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Arg Gly Ala Lys Lys Leu Glu Ser Ser Glu Glu Asn Leu Ser Ser	
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Glu Asp Glu Glu Leu Pro Cys Phe Gln His Leu Leu Phe Gly Lys	
1220 1225 1230	
gta aac aat ata cct tct cag tct act agg cat agc acc gtt gct	3863
Val Asn Asn Ile Pro Ser Gln Ser Thr Arg His Ser Thr Val Ala	
1235 1240 1245	
acc gag tgt ctg tct aag aac aca gag gag aat tta tta tca ttg	3908
Thr Glu Cys Leu Ser Lys Asn Thr Glu Glu Asn Leu Leu Ser Leu	
1250 1255 1260	
aag aat agc tta aat gac tgc agt aac cag gta ata ttg gca aag	3953
Lys Asn Ser Leu Asn Asp Cys Ser Asn Gln Val Ile Leu Ala Lys	
1265 1270 1275	
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Ala Ser Gln Glu His His Leu Ser Glu Glu Thr Lys Cys Ser Ala	
1280 1285 1290	
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Ser Leu Phe Ser Ser Gln Cys Ser Glu Leu Glu Asp Leu Thr Ala	
1295 1300 1305	
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Asn Thr Asn Thr Gln Asp Pro Phe Leu Ile Gly Ser Ser Lys Gln	
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Gly Leu Ser Ser Gln Ser Asp Ile Leu Thr Thr Gln Gln Arg Asp	
1385 1390 1395	
acc atg caa cat aac ctg ata aag ctc cag cag gaa atg gct gaa	4358
Thr Met Gln His Asn Leu Ile Lys Leu Gln Gln Glu Met Ala Glu	
1400 1405 1410	



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Tyr Pro Ser Ile Ile Ser Asp Ser Ser Ala Leu Glu Asp Leu Arg	
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Lys Ser Ser Glu Tyr Pro Ile Ser Gln Asn Pro Glu Gly Leu Ser	
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Ala Asp Lys Phe Glu Val Ser Ala Asp Ser Ser Thr Ser Lys Asn	
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Lys Glu Pro Gly Val Glu Arg Ser Ser Pro Ser Lys Cys Pro Ser	
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Leu Glu Ser Gly Ile Ser Leu Phe Ser Asp Asp Pro Glu Ser Asp	
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Pro Ser Glu Asp Arg Ala Pro Glu Ser Ala Arg Val Gly Asn Ile	
1580 1585 1590	
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Pro Ser Ser Thr Ser Ala Leu Lys Val Pro Gln Leu Lys Val Ala	
1595 1600 1605	
gaa tct gcc cag agt cca gct gct gct cat act act gat act gct	4988
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Gly Tyr	Asn Ala Met Glu Glu	Ser Val Ser Arg Glu	Lys Pro Glu	
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Leu Thr Ala Ser Thr Glu Arg	Val Asn Lys Arg Met	Ser Met Val		
1640	1645	1650		
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Ala Arg Lys His His Ile Thr	Leu Thr Asn Leu Ile	Thr Glu Glu		
1670	1675	1680		
act act cat gtt gtt atg aaa	aca gat gct gag ttt	gtg tgt gaa	5213	
Thr Thr His Val Val Met Lys	Thr Asp Ala Glu Phe	Val Cys Glu		
1685	1690	1695		
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Arg Asn His Gln Gly Pro Lys	Arg Ala Arg Glu Ser	Gln Asp Arg		
1745	1750	1755		
aag atc ttc agg ggg cta gaa	atc tgt tgc tat ggg	ccc ttc acc	5438	
Lys Ile Phe Arg Gly Leu Glu	Ile Cys Cys Tyr Gly	Pro Phe Thr		
1760	1765	1770		
aac atg ccc aca gat caa ctg	gaa tgg atg gta cag	ctg tgt ggt	5483	
Asn Met Pro Thr Asp Gln Leu	Glu Trp Met Val Gln	Leu Cys Gly		
1775	1780	1785		
gct tct gtg gtg aag gag ctt	tca tca ttc acc ctt	ggc aca ggt	5528	
Ala Ser Val Val Lys Glu Leu	Ser Ser Phe Thr Leu	Gly Thr Gly		
1790	1795	1800		
gtc cac cca att gtg gtt gtg	cag cca gat gcc tgg	aca gag gac	5573	
Val His Pro Ile Val Val Val	Gln Pro Asp Ala Trp	Thr Glu Asp		
1805	1810	1815		
aat ggc ttc cat gca att ggg	cag atg tgt gag gca	cct gtg gtg	5618	
Asn Gly Phe His Ala Ile Gly	Gln Met Cys Glu Ala	Pro Val Val		
1820	1825	1830		
acc cga gag tgg gtg ttg gac	agt gta gca ctc tac	cag tgc cag	5663	
Thr Arg Glu Trp Val Leu Asp	Ser Val Ala Leu Tyr	Gln Cys Gln		

1835	1840	1845	
gag ctg gac acc tac ctg ata ccc cag atc ccc cac agc cac tac			5708
Glu Leu Asp Thr Tyr Leu Ile Pro Gln Ile Pro His Ser His Tyr			
1850	1855	1860	
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Ala Met Gln Lys Ile Leu Glu Cys Pro Ile Cys Leu Glu Leu Ile Lys			
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Glu Pro Val Ser Thr Lys Cys Asp His Ile Phe Cys Lys Phe Cys Met			
35 40 45			
Leu Lys Leu Leu Asn Gln Lys Lys Gly Pro Ser Gln Cys Pro Leu Cys			
50 55 60			
Lys Asn Asp Ile Thr Lys Arg Ser Leu Gln Glu Ser Thr Arg Phe Ser			
65 70 75 80			
Gln Leu Val Glu Glu Leu Leu Lys Ile Ile Cys Ala Phe Gln Leu Asp			
85 90 95			
Thr Gly Leu Glu Tyr Ala Asn Ser Tyr Asn Phe Ala Lys Lys Glu Asn			
100 105 110			
Asn Ser Pro Glu His Leu Lys Asp Glu Val Ser Ile Ile Gln Ser Met			
115 120 125			
Gly Tyr Arg Asn Arg Ala Lys Arg Leu Leu Gln Ser Glu Pro Glu Asn			
130 135 140			
Pro Ser Leu Gln Glu Thr Ser Leu Ser Val Gln Leu Ser Asn Leu Gly			
145 150 155 160			
Thr Val Arg Thr Leu Arg Thr Lys Gln Arg Ile Gln Pro Gln Lys Thr			
165 170 175			
Ser Val Tyr Ile Glu Leu Gly Ser Asp Ser Ser Glu Asp Thr Val Asn			
180 185 190			
Lys Ala Thr Tyr Cys Ser Val Gly Asp Gln Glu Leu Leu Gln Ile Thr			
195 200 205			
Pro Gln Gly Thr Arg Asp Glu Ile Ser Leu Asp Ser Ala Lys Lys Ala			
210 215 220			

Ala Cys Glu Phe Ser Glu Thr Asp Val Thr Asn Thr Glu His His Gln  
 225 230 235 240  
 Pro Ser Asn Asn Asp Leu Asn Thr Thr Glu Lys Arg Ala Ala Glu Arg  
 245 250 255  
 His Pro Glu Lys Tyr Gln Gly Ser Ser Val Ser Asn Leu His Val Glu  
 260 265 270  
 Pro Cys Gly Thr Asn Thr His Ala Ser Ser Leu Gln His Glu Asn Ser  
 275 280 285  
 Ser Leu Leu Leu Thr Lys Asp Arg Met Asn Val Glu Lys Ala Glu Phe  
 290 295 300  
 Cys Asn Lys Ser Lys Gln Pro Gly Leu Ala Arg Ser Gln His Asn Arg  
 305 310 315 320  
 Trp Ala Gly Ser Lys Glu Thr Cys Asn Asp Arg Arg Thr Pro Ser Thr  
 325 330 335  
 Glu Lys Lys Val Asp Leu Asn Ala Asp Pro Leu Cys Glu Arg Lys Glu  
 340 345 350  
 Trp Asn Lys Gln Lys Leu Pro Cys Ser Glu Asn Pro Arg Asp Thr Glu  
 355 360 365  
 Asp Val Pro Trp Ile Thr Leu Asn Ser Ser Ile Gln Lys Val Asn Glu  
 370 375 380  
 Trp Phe Ser Arg Ser Asp Glu Leu Leu Gly Ser Asp Asp Ser His Asp  
 385 390 395 400  
 Gly Glu Ser Glu Ser Asn Ala Lys Val Ala Asp Val Leu Asp Val Leu  
 405 410 415  
 Asn Glu Val Asp Glu Tyr Ser Gly Ser Ser Glu Lys Ile Asp Leu Leu  
 420 425 430  
 Ala Ser Asp Pro His Glu Ala Leu Ile Cys Lys Ser Glu Arg Val His  
 435 440 445  
 Ser Lys Ser Val Glu Ser Asn Ile Glu Asp Lys Ile Phe Gly Lys Thr  
 450 455 460  
 Tyr Arg Lys Lys Ala Ser Leu Pro Asn Leu Ser His Val Thr Glu Asn  
 465 470 475 480  
 Leu Ile Ile Gly Ala Phe Val Thr Glu Pro Gln Ile Ile Gln Glu Arg  
 485 490 495  
 Pro Leu Thr Asn Lys Leu Lys Arg Lys Arg Arg Pro Thr Ser Gly Leu  
 500 505 510  
 His Pro Glu Asp Phe Ile Lys Lys Ala Asp Leu Ala Val Gln Lys Thr  
 515 520 525

Pro Glu Met Ile Asn Gln Gly Thr Asn Gln Thr Glu Gln Asn Gly Gln  
 530 535 540  
 Val Met Asn Ile Thr Asn Ser Gly His Glu Asn Lys Thr Lys Gly Asp  
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 Ser Ile Gln Asn Glu Lys Asn Pro Asn Pro Ile Glu Ser Leu Glu Lys  
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 Glu Ser Ala Phe Lys Thr Lys Ala Glu Pro Ile Ser Ser Ser Ile Ser  
 580 585 590  
 Asn Met Glu Leu Glu Leu Asn Ile His Asn Ser Lys Ala Pro Lys Lys  
 595 600 605  
 Asn Arg Leu Arg Arg Lys Ser Ser Thr Arg His Ile His Ala Leu Glu  
 610 615 620  
 Leu Val Val Ser Arg Asn Leu Ser Pro Pro Asn Cys Thr Glu Leu Gln  
 625 630 635 640  
 Ile Asp Ser Cys Ser Ser Ser Glu Glu Ile Lys Lys Lys Lys Tyr Asn  
 645 650 655  
 Gln Met Pro Val Arg His Ser Arg Asn Leu Gln Leu Met Glu Gly Lys  
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 Glu Pro Ala Thr Gly Ala Lys Lys Ser Asn Lys Pro Asn Glu Gln Thr  
 675 680 685  
 Ser Lys Arg His Asp Ser Asp Thr Phe Pro Glu Leu Lys Leu Thr Asn  
 690 695 700  
 Ala Pro Gly Ser Phe Thr Lys Cys Ser Asn Thr Ser Glu Leu Lys Glu  
 705 710 715 720  
 Phe Val Asn Pro Ser Leu Pro Arg Glu Glu Lys Glu Glu Lys Leu Glu  
 725 730 735  
 Thr Val Lys Val Ser Asn Asn Ala Glu Asp Pro Lys Asp Leu Met Leu  
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 Ser Gly Glu Arg Val Leu Gln Thr Glu Arg Ser Val Glu Ser Ser Ser  
 755 760 765  
 Ile Ser Leu Val Pro Gly Thr Asp Tyr Gly Thr Gln Glu Ser Ile Ser  
 770 775 780  
 Leu Leu Glu Val Ser Thr Leu Gly Lys Ala Lys Thr Glu Pro Asn Lys  
 785 790 795 800  
 Cys Val Ser Gln Cys Ala Ala Phe Glu Asn Pro Lys Gly Leu Ile His  
 805 810 815  
 Gly Cys Ser Lys Asp Asn Arg Asn Asp Thr Glu Gly Phe Lys Tyr Pro  
 820 825 830

Leu Gly His Glu Val Asn His Ser Arg Glu Thr Ser Ile Glu Met Glu  
 835 840 845  
 Glu Ser Glu Leu Asp Ala Gln Tyr Leu Gln Asn Thr Phe Lys Val Ser  
 850 855 860  
 Lys Arg Gln Ser Phe Ala Leu Phe Ser Asn Pro Gly Asn Ala Glu Glu  
 865 870 875 880  
 Glu Cys Ala Thr Phe Ser Ala His Ser Gly Ser Leu Lys Lys Gln Ser  
 885 890 895  
 Pro Lys Val Thr Phe Glu Cys Glu Gln Lys Glu Glu Asn Gln Gly Lys  
 900 905 910  
 Asn Glu Ser Asn Ile Lys Pro Val Gln Thr Val Asn Ile Thr Ala Gly  
 915 920 925  
 Phe Pro Val Val Gly Gln Lys Asp Lys Pro Val Asp Asn Ala Lys Cys  
 930 935 940  
 Ser Ile Lys Gly Gly Ser Arg Phe Cys Leu Ser Ser Gln Phe Arg Gly  
 945 950 955 960  
 Asn Glu Thr Gly Leu Ile Thr Pro Asn Lys His Gly Leu Leu Gln Asn  
 965 970 975  
 Pro Tyr Arg Ile Pro Pro Leu Phe Pro Ile Lys Ser Phe Val Lys Thr  
 980 985 990  
 Lys Cys Lys Lys Asn Leu Leu Glu Glu Asn Phe Glu Glu His Ser Met  
 995 1000 1005  
 Ser Pro Glu Arg Glu Met Gly Asn Glu Asn Ile Pro Ser Thr Val  
 1010 1015 1020  
 Ser Thr Ile Ser Arg Asn Asn Ile Arg Glu Asn Val Phe Lys Glu  
 1025 1030 1035  
 Ala Ser Ser Ser Asn Ile Asn Glu Val Gly Ser Ser Thr Asn Glu  
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 Gln Ala Glu Leu Gly Arg Asn Arg Gly Pro Lys Leu Asn Ala Met  
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 Pro Gly Ser Asn Cys Lys His Pro Glu Ile Lys Lys Gln Glu Tyr  
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 Glu Glu Val Val Gln Thr Val Asn Thr Asp Phe Ser Pro Tyr Leu  
 1115 1120 1125